

5.0 CUMULATIVE IMPACTS

This chapter summarizes the potential cumulative physical and growth-related environmental consequences associated with the Patterson Ranch Planned District project.

5.1 REGULATIONS AND STANDARDS

The California Environmental Quality Act (CEQA) requires an evaluation of a project's contribution to cumulative environmental impacts. According to Section 15355 of the CEQA Guidelines, cumulative impacts are defined as "two or more individual effects which, when taken together, are considerable, or which can compound or increase other environmental impacts." As stated in the Guidelines, an individual project may not have significant impacts; however, in combination with other related projects, the cumulative effects may be significant. When evaluating cumulative impacts, CEQA recommends one of two methods:

1. Projects to consider in the cumulative analysis include any past, present, and probable future projects producing related or cumulative impacts, including projects outside the control of the lead agency, or
2. The cumulative analysis would consider projections contained in an adopted local, regional, or statewide plan, or would use a prior environmental document which has been adopted or certified for such a plan.

For the majority of this analysis, the first method of evaluation was used. A cumulative projects list was generated through discussions with planning staff in Fremont and Union City. This list of projects is provided in **Section 5.2, Related Cumulative Projects**.

For the cumulative discussions of traffic, air quality and noise, the second method was used. As these issue areas are greatly affected by the growth of regional traffic volumes, the cumulative analysis is built on the 2015 and 2030 Fremont travel demand model maintained by the Alameda County Congestion Management Agency, which includes an annual growth factor to account for regional increases in vehicle traffic and congestion.

For the cumulative discussion of greenhouse gas emissions (which is included in **Section 4.8**), the second method was also used. In particular, the methodology developed by the Bay Area Air Quality Management District (BAAQMD), which considers global climate change and state goals, was used. In certain other sections, other geographic areas were used to consider cumulative impacts, as explained in the relevant sections described below.

5.2 RELATED CUMULATIVE PROJECTS

The cumulative projects list incorporates reasonably foreseeable, relevant projects and focuses on those that, when combined with the Patterson Ranch Planned District project, could contribute to cumulative impacts.

The cumulative projects list was developed based on the April 2010 traffic study prepared for the project by DKS Associates that is appended to this ~~Recirculated Draft Final~~ EIR as **Appendix J**. The projects discussed in this section are planned or proposed projects that are close enough to the project area to contribute to cumulative environmental conditions. Cumulative projects include both transportation and development projects.

Transportation Projects

The following roadway improvement was assumed to be implemented prior to the completion date of the project (2025):

- Traffic signal installations were in the design stage for the intersections of Thornton Avenue/Eastbound State Route (SR) 84 and Paseo Padre Parkway/Westbound SR 84 when the initial intersection count volumes were collected in 2007. The signal installations are approximately 0.4 miles south of the project area and were completed in 2009.

Development Projects

The following projects are anticipated to be completed prior to the development of the Patterson Ranch Planned District project.

- The Villa d'Este Residential Development is directly across Paseo Padre Parkway from the project area, southeast of the Ardenwood Boulevard Paseo Padre Parkway intersection, and has been partially completed. It includes 243 condominiums/townhomes and 33 single family units.

- The Dumbarton Quarry is a gravel mining operation directly southwest of the project area, bordered by SR 84 and Coyote Hills Regional Park. The quarry is now closed and will be restored as parkland (including a lake as the primary water feature). The entire 91-acre site is adjacent to Coyote Hills Regional Park.
- Three projects, listed below, are planned in Union City in the near term. None of these projects are adjacent to the project area although they are within the vicinity.
 - A mixed-use project that will include 20,000 square feet of commercial space and 22 residential units.
 - A residential project that will include 210 new single-family homes.
 - A townhouse project that will include 16 residential units.

5.3 ANALYSIS OF CUMULATIVE IMPACTS

The following analysis describes the potential for the Patterson Ranch Planned District project, in combination with the cumulative projects to result in cumulatively significant environmental impacts. Each analysis considers the cumulative setting of the potential impact, and whether the method of evaluation should be focused on the cumulative projects list and/or projections contained in an adopted local, regional, or statewide plan. The evaluation identifies whether the cumulative impact would be significant, and whether the project's contribution to a significant cumulative impact would be considerable.

5.3.1 AESTHETICS

The cumulative setting for aesthetics includes any proposed development and/or cumulative projects within the same viewshed as the project area. As previously discussed in **Section 4.1, Aesthetics**, while the project would alter views of the Coyote Hills Regional Park, these changes would be minimal, and would not substantially alter scenic views. Furthermore, development of the project would not alter protected views from the Coyote Hills Regional Park trails to Fremont or the Crandall Creek (K-line channel) and the Alameda Creek Flood Control Channel. The planned projects in Union City are dispersed over a large area and not adjacent to the Patterson Ranch Planned District area. Therefore, these projects would not visually combine such that they would together block existing views of sensitive vistas, such as the Coyote Hills.

Cumulative projects that are within visual proximity to the project include the Dumbarton Quarry project and the Villa d'Este residential project. The Dumbarton Quarry project would not obstruct any views as it involves reclamation of a quarry into open space parkland; furthermore, this project would improve public access to the area and would therefore increase visual access to the Coyote Hills. The Villa d'Este project and the project would convert vacant land to developed land uses, especially northeast of Ardenwood Boulevard. However, there are no public viewpoints where views toward the Coyote Hills (i.e., east of Villa d'Este) would be obstructed by both projects. Therefore, the project in combination with the cumulative projects would not substantially affect protected views in the vicinity of the project. Cumulative impacts related to obstructions of a scenic vista would therefore be less than significant.

The existing visual setting is characterized by large expanses of open space bordered by residential development to the northeast, northwest, and southeast. Implementation of the project in combination with the cumulative projects would introduce additional development but would also preserve and rehabilitate open space areas, generally maintaining the existing relationship of open space to developed uses. The project would retain 316 acres as open space and the Dumbarton Quarry project would restore the former gravel mining operation to parkland to be added to Coyote Hills Regional Park. Cumulative impacts to visual character would therefore be less than significant because the relationships of developed and undeveloped land would be maintained, while preserving open space and increasing parkland.

While cumulative increases to nighttime lighting in the vicinity of the project area would be introduced from the residential development of the project and the Villa d'Este project (e.g., exterior home lighting fixtures, security lighting, and internal neighborhood street lights), spillover lighting from these projects would be limited through compliance with City lighting standards and the standard California Building Code, which reduce the lateral spreading of light to surrounding uses. As previously discussed in **Section 4.1**, the project proponent(s) would be required to prepare a lighting plan that would reduce potential lighting impacts to a less-than-significant level (**Mitigation Measure AES-7**). Additionally, the increase in nighttime lighting resulting from the project and the Villa d'Este development, when considered in the context of the overall development in Fremont and Union City, would be consistent with the urban edge interface that already exists in the vicinity of the project. The parkland that would be developed at the former Quarry site would not be anticipated to provide night lighting. Cumulative impacts to nighttime views would therefore be less than significant.

5.3.2 AGRICULTURAL RESOURCES

Impact CUM-AG 1: Development of the project in combination with other development in the region has the potential to cumulatively impact state-designated important farmland. (Significant)

The cumulative setting for agricultural resources includes proposed development within Alameda County that could potentially convert open space/farmlands to urban land uses. There has been a trend of conversion of farmland to developed land in Alameda County that has resulted in the loss of substantial areas of farmland. According to the California Department of Conservation (DOC), approximately 2,000 acres of Important Farmland (i.e., Prime Farmland, Farmland of Statewide Importance, and Unique Farmland) were converted to other uses between 1996 and 2006 in Alameda County, representing approximately 19 percent of the total Important Farmland inventoried in the County.¹ Construction of the project in combination with other projects would contribute to the continued loss of agricultural land in the County. This is considered a significant cumulative impact.

As previously discussed in **Section 4.2, Agricultural and Forest Resources**, the majority of the soils on the project area are classified as Class I and Class II soils, which are considered “prime agricultural land” under Section 56064 (a) of the California Government Code. ~~Removal of up to 4 feet of soil is proposed in the southern portion of the project area to provide level foundation for the development of site 1. This action would affect approximately 138 acres of Class I and Class II soils located in that portion of the project area, resulting in the loss of the prime agricultural land. Furthermore, t~~The construction of the proposed site 1 residential development and site 2 religious facilities would result in the permanent conversion of approximately 111 acres of prime agricultural land. ~~The loss of approximately 249 acres of~~This loss of prime agricultural land (impacts related to the borrow areas plus the permanent conversion of lands on site 1) in the project area would be a considerable contribution to the permanent loss of agricultural land in the County.

¹ Alameda County Land Use Conversion Tables 1996-1198 and 2004-2006. Available at <http://www.conservation.ca.gov/dlrp/fmmp/products/Pages/ReportsStatistics.aspx> . Accessed June 24, 2009.

Mitigation Measure CUM AG-1: ~~Purchase of~~ Establish agricultural conservation easements.

Implement **Mitigation Measure AG-1a**, which requires the project proponent(s) to purchase or provide funds for agricultural conservation easements, or employ other measures of land restriction within the County, on land of at least equal quality and size as the ~~partial compensation for the direct loss of agricultural land within impacted by the project area.~~

Significance after Mitigation: Significant and Unavoidable.

Implementation of **Mitigation Measures CUM AG-1** would ~~minimize~~ reduce this impact through the conservation of agricultural lands of equal quality and size; however, because of the direct permanent conversion of prime agricultural lands to non-agricultural uses, this Recirculated EIR considers this impact to be significant and unavoidable. No other feasible mitigation measures have been identified.

5.3.3 AIR QUALITY

The cumulative setting for air quality includes any proposed development within the jurisdiction of the BAAQMD, except when evaluating impacts related to odors and fugitive dust, which are localized affects of development in the immediate vicinity of the project area. According to the BAAQMD Guidelines, any project that would individually have a significant air quality impact would also have a significant cumulative air quality impact.

The emissions modeling for localized carbon monoxide (CO) levels in **Section 4.3** of this EIR also utilized the cumulative traffic volumes, which incorporated future projects in the immediate area. This analysis found no significant concentrations of this air pollutant under this cumulative scenario. Therefore, cumulative CO impacts would be less than significant.

The project in combination with the cumulative projects could temporarily create odors and fugitive dust during construction. The nearby Villa d'Este project, could temporarily contribute odors and fugitive dust during construction that could affect nearby sensitive receptors. However, it is anticipated that the Villa d'Este project would be completed prior to the initiation of development of the project, and would therefore not generate dust and odors associated with construction activities at the same time as the project. Additionally, both the project and the Villa d'Este development would be subject to the BAAQMD recommended dust and diesel exhaust control measures identified in **Mitigation Measures AQ-4a and AQ-4b**. Implementation of the recommended measures would reduce construction period

emissions such that impacts from fugitive dust and odor would not be significant. The planned projects in Union City are dispersed over a large area and not adjacent to the project area. As such, those projects are too distant to affect the sensitive receptors surrounding the project area. Therefore, cumulative impacts to odors and fugitive dust would be less than significant.

Impact CUM AQ-1: Development of the project in conjunction with other development in the region would result in a net increase of Reactive Organic Gases (ROG), a criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard. (Significant)

The Bay Area is considered a non-attainment area for ground-level ozone (O_3) under both the Federal Clean Air Act (CAA) and the California CAA. The area is also considered non-attainment for particulate matter (PM_{10}) and ($PM_{2.5}$). As part of an effort to attain and maintain ambient air quality standards for O_3 and PM_{10} , and $PM_{2.5}$, BAAQMD has established thresholds of significance for O_3 precursor pollutants (reactive organic gases [ROG] and nitrogen oxides) and PM_{10} and $PM_{2.5}$.

As described in **Section 4.3, Air Quality**, the project would exceed the BAAQMD-recommended operational threshold of significance for ROG resulting in a significant impact. Mitigation measures are proposed to help reduce ROG emissions; however, even with implementation of these measures, the project would continue to exceed BAAQMD's significant threshold for ROG emissions, and the impact remains significant. As described above, according to the BAAQMD Guidelines, any project that would individually have a significant air quality impact would also have a significant cumulative air quality impact.

Mitigation Measure CUM AQ-1a: Incorporate Measures to Reduce Air Pollutant Emissions.

Implement **Mitigation Measure AQ-1a**, which requires the project proponent(s) to incorporate additional measures to reduce ROG emissions.

Mitigation Measure CUM AQ-1b: Incorporate green building design and construction measures pursuant to the Alameda County Build It Green Program.

Implement **Mitigation Measure AQ-1b**, which requires, prior to the issuance of building permits, the City to confirm that the measures proposed as part of the project, pursuant to the project's involvement in the Alameda County Build It Green program for single family homes, have been incorporated into the final project design and construction plans for the development of single-family homes in the project area.

Significance after Mitigation: Significant and Unavoidable.

While specific measures proposed as part of the project, as well as those included in **Mitigation Measures CUM AQ-1a** and **CUM AQ-1b**, would reduce ROG emissions associated with project development to 60 pounds per day (see **Table 4.3-5, Daily Project Emissions in Pounds per Day**), ROG emissions would continue to exceed the BAAQMD significant threshold of 54 pounds per day. As such, this impact would be significant and unavoidable.

Impact CUM AQ-2: Development of the project in conjunction with other development in the region would conflict with implementation of the 2005 Bay Area Ozone Strategy, specifically in regards to population, vehicle miles traveled, and transportation control measures. (Significant)

In March 2010, BAAQMD released the Draft Bay Area 2010 Clean Air Plan, as well as the accompanying Draft Programmatic Environment Impact Report. The Bay Area 2010 Clean Air Plan will:

- Update the current Bay Area 2005 Ozone Strategy in accordance with the requirements of the California CAA to implement “all feasible measures” to reduce ozone;
- Provide a control strategy to reduce O₃, PM₁₀ and PM_{2.5}, Toxic Air Contaminants (TACs), and greenhouse gases in a single, integrated plan;
- Review progress in improving air quality in recent years; and
- Establish emission control measures to be adopted or implemented in the 2010-2012 timeframe.

The public comment period for the plan and associated EIR closed in late April 2010. As of June 2, 2010 this plan has not been adopted.

The current plan in effect is the *2005 Bay Area Ozone Strategy*. The project would result in a higher population density than was anticipated in that plan. This greater population would result in increased vehicle usage and increased air pollutant emissions over what was anticipated for the project area under the Open Space-Urban Reserve designation. The increased emissions associated with increased population allowed by the proposed General Plan Amendment would incrementally exacerbate the nonattainment of ambient air quality standards, representing a cumulative significant impact to air quality. No feasible mitigation measures have been identified beyond those discussed under **CUM AQ-1a** and **CUM AQ-1b**.

Significance after Mitigation: Significant and Unavoidable

Although implementation of **Mitigation Measures CUM AQ-1a** and **CUM AQ-1b** would support the efforts of the BAAQMD to meet attainment standards for O₃, implementation of the project would result in a new land use density for the project area, which may contribute to emissions of O₃ precursors greater than projected and planned for in the 2005 Bay Area Ozone Strategy and so this impact would be significant and unavoidable.

5.3.4 BIOLOGICAL RESOURCES

The cumulative setting for biological resources includes any proposed development that could affect the biological resources in the vicinity of the project area, including the cumulative projects identified in this chapter. These resources include the protected undeveloped lands bordering the project (i.e., Coyote Hills Regional Park), which include wetlands and wildland habitat for sensitive biological species. Because Fremont and the surrounding cities are largely urbanized, it is unlikely that the planned development within these cities would result in a significant cumulative impact to these biological resources. The project in combination with the cumulative projects would protect additional open space areas in Fremont, but would develop and grade land that is now vacant. The closure of Dumbarton Quarry would add 91 acres of protected open space to the Coyote Hills Regional Park through rehabilitation of the former quarry. The other cumulative projects are not located on sites with high habitat value and will not affect the undeveloped lands bordering the project. Given the acreage of open space to be donated by the project and the Dumbarton Quarry project, and the fact that other pending projects in the area will not affect Coyote Hills Regional Park or other areas with high habitat values, cumulative impacts to biological resources would be less than significant.

5.3.5 CULTURAL RESOURCES

The cumulative setting for cultural resources includes those planned developments identified in this chapter that could potentially affect non-renewable archeological or historical resources. Because the project and its vicinity is located in an area that has been previously characterized as having “extreme” and “high” sensitivity for prehistoric archaeological resources, development of the project area in combination with the cumulative projects could potentially result in impacts to cultural resources. However, for projects in sensitive archaeological areas within the City of Fremont, the City will require the provision of archaeological and/or

Native American monitors throughout construction as described in **Section 4.5, Cultural Resources**, to mitigate the impact. No historic resources will be affected on the Villa d'Este and Dumbarton Quarry sites. For cumulative projects located in Union City, the City has not identified additional impacts on cultural resources. Given the above, cumulative impacts associated with cultural resources would therefore be less than significant.

5.3.6 EMERGENCY SERVICES

The cumulative setting for emergency services includes any proposed development within the City of Fremont Police and Fire Department service districts that, in combination with the project, may generate the need for new facilities. The implementation of the project in combination with the cumulative projects, in particular Villa D'Este development, would increase demands for police and fire services. While the police department has not identified a need for additional facilities, the fire department has identified facility needs, which are included in the City's capital improvement program. -In accordance with the City's capital improvement program, the project and other cumulative development will be required to pay fire impact fees that will provide funding to help the FFD plan facility and staff expansion to further serve the City and project area. Payment of impact fees will reduce the potential cumulative impacts on the need for Fire Department facilities to a less-than-significant level.

5.3.7 GEOLOGY, SOILS AND MINERAL RESOURCES

Geological hazards related to future development in the project vicinity are site specific and relate to the type of building and building foundation proposed, as well as the soil composition and slope on the site. Implementation of **Mitigation Measures GEO-1, GEO-2, GEO-3 (a through c), and GEO-4** would reduce project specific impacts related to Geology, Soils and Mineral Resources to a less-than-significant level. Additionally, because development on each site would be subject to site-development and construction standards that are designed to protect public safety in accordance with state law and the Uniform Building Code, implementation of the project in combination with the cumulative projects identified in this chapter, would not result in cumulatively significant impacts associated with the exposure of persons or structures to potential risks involving a geologic hazard, potentially unstable soils, expansive soils or erosion.

Impact CUM GEO-1: Development of the project in conjunction with other development in the region has the potential to cumulatively impact state-designated significant mineral resources. (Significant)

The cumulative setting for mineral resources includes any proposed development in Alameda County that could affect the state-designated regionally significant mineral resources in the project area. The project would result in the loss of known mineral resources scattered through the project area. Development of other projects in the region also has the potential to impact state-designated regionally significant mineral resources. The loss of these resources from development of the project and other projects in the region would be a cumulatively significant impact.

As described in **Impact GEO-5**, mineral deposits are scattered around the project area, in the northern and central portions of site, at varying depths of 11 feet or more. Development of the project would result in the loss of known mineral resources that could be value to the region and the residents of the state. No feasible mitigation measures have been identified that would prevent the extraction of regionally significant sand and gravel deposits from the project area. For this reason, the project would considerably contribute to the loss of mineral resources that could occur with the development of other projects in the region. This constitutes a significant and unavoidable cumulative impact.

Significance after Mitigation: Significant and Unavoidable

The project would considerably contribute to the loss of mineral resources that could occur with the development of the project in combination with other projects in the region. No feasible mitigation measures have been identified. This constitutes a significant and unavoidable cumulative impact.

5.3.8 GREENHOUSE GAS EMISSIONS

The cumulative context evaluated for impacts to greenhouse gas (GHG) emissions includes any proposed development within the jurisdiction of the BAAQMD. According to the BAAQMD CEQA Guidelines, any project that would individually have a significant air quality impact would also have a significant cumulative air quality impact. For the purposes of this analysis, the project's potential impact related to GHG emissions is therefore considered a cumulative impact.

As discussed in **Section 4.8, Greenhouse Gas Emissions**, while specific measures proposed as part of the project, as well as those included in **Mitigation Measure GHG-1**, would incorporate green building measures to reduce GHG emissions, consistent with Assembly Bill 32(AB32), the project would continue to exceed the

4.6 metric ton of carbon dioxide equivalents (CO₂e) per capita per year BAAQMD threshold. Project emissions would represent a considerable contribution to the impact. Given this, cumulative greenhouse gas emissions impacts would be significant and unavoidable.

5.3.9 HAZARDS AND HAZARDOUS MATERIALS

Hazardous material issues are generally site specific and relate to the prior history of land uses on the site, or to adjacent sites. Except in cases where there is a major hazardous site nearby (i.e., a Superfund Site), these impacts are site-specific, since they generally only affect conditions within a single site. As such, the cumulative setting for hazardous materials includes the project in combination with cumulative projects listed in **Section 5.2**. These projects, as well as the project, are primarily residential and recreational projects, and it is not anticipated that they would use quantities of hazardous materials that would combine in such a way to endanger human or environmental health. Hazardous materials are strictly regulated by local, state and federal laws specifically to ensure that they do not result in a gradual increase to toxins in the environment. In addition, the implementation of mitigation required for the project in **Section 4.9** would eliminate the potential hazardous material exposure risks of the construction workers and lessen potential project impacts to a less-than-significant level. As a result, the development of the project in combination with other projects in the area would not result in a significant cumulative impact related to hazards or hazardous materials.

5.3.10 HYDROLOGY AND WATER QUALITY

The cumulative for hydrology and water quality includes any proposed development within the watershed to which the site drains, which includes the Villa d'Este project and the Dumbarton Quarry described above in **Section 5.2**.

Construction of the project in combination with the cumulative projects would contribute to the disruption of soils such that they could be carried in stormwater runoff to local waterways and wetlands and into the San Francisco Bay. During project operation, stormwater could similarly carry pollutants, including oil residues from paved surfaces, litter, and eroded top soils. These materials can result in diminished water quality and increased sedimentation in local waterways, and cause pollutants to accumulate in the Bay. Similar to the mitigation required for the

project in **Section 4.10, Hydrology and Water Quality**, other cumulative projects would be required to comply with the National Pollutant Discharge Elimination System (NPDES) permit requirements, including preparation of a Storm Water Pollution Prevention Plan (SWPPP) and incorporation of Best Management Practices (BMPs), which would require individual onsite treatment of runoff before it is discharged. Cumulative impacts to stormwater quality would therefore be less than significant.

Development of the project in combination with other development in the region would contribute to an increase in impervious surface in the watershed area that could increase the quantity and velocity of stormwater runoff and reduce groundwater recharge. However, all future and planned projects in the County would be required to comply with the requirements of the Alameda County Flood Control District and State Water Resource Control Board C3 regulations. These regulations require the incorporation of post-construction stormwater controls, which include measures to reduce stormwater pollutants, promote groundwater recharge, or otherwise minimize the change in rate and flow of stormwater runoff. Each project would convey its stormwater runoff via different drainage systems, which would be required to have adequate capacity for any increased runoff. Therefore, the project in combination with other planned project would have a less-than-significant cumulative impact to groundwater recharge and stormwater runoff velocity and quantity.

The development of the project in combination with the cumulative projects listed in **Section 5.2**, would not increase the potential exposure of individuals and structures to flooding due to floodplain hydrology. As previously discussed in **Section 4.10, Hydrology and Water Quality**, the project would place housing within a 100-year flood hazard area as delineated on the Federal Emergency Management Agency (FEMA) Flood Zone Map for Fremont. However, hydrologic data prepared for the project shows that the 100-year flood event would be contained within adjacent channels. None of the planned residential and/or recreational development would be located within the 100-year floodplain. In addition, the Dumbarton Quarry would be undeveloped, and would establish land uses that are compatible with periodic inundation. Therefore no cumulative impact related to development within a 100-year floodplain would occur.

Impact CUM HYDRO-1: The project in combination with other projects in the surrounding areas would develop land that is located within areas of projected tidal inundation due to sea level rise, which could expose people and structures to flood hazards associated with long-term sea level rise past 2050. (Significant)

The cumulative setting for sea level rise includes planned development that falls within the sea level rise flood risk hazard map prepared for the City of Newark quadrangle, as shown on **Figure 4.10-2, Sea Level Rise: Flood Risk Hazard Map.**² The cumulative projects listed in **Section 5.2** are included in this map. Of the cumulative projects, the Villa d'Este and Dumbarton Quarry projects would fall within the same flood inundation risk areas identified for the project area. The development of the project in combination with the cumulative projects would therefore increase the potential exposure of individuals and structures to flooding due to sea level rise. This is considered a significant cumulative impact, of which the project would have a considerable contribution towards.

Mitigation Measure CUM HYDRO-1: Levee Improvements for Future Sea-Level Rise.

Implement **Mitigation Measure HYDRO-9**, which requires improvements along Crandall Creek (K-line channel) shall be designed to allow for future increases in ~~elevation-levee heights~~ to protect against higher sea level rise ~~values, should they occur to 2100.~~ Project Design design elements shall include providing adequate protection for residents of the project area to allow for from future ~~elevation-water level~~ increases along the creek.

Significance after Mitigation: Significant and Unavoidable

Due to this uncertainty regarding the adequacy of potential mitigation to 2010, the level of significance of this impact is considered significant and unavoidable.

5.3.11 LAND USE AND PLANNING

The cumulative for land use and planning includes development anticipated in the existing Fremont and Union City planning documents, such as the cities' General Plans. This includes the projects listed in **Section 5.2**. Both Fremont and Union City are largely built out, and the majority of future development will generally involve redevelopment of existing areas or infill development of vacant lots within urbanized areas. Much of this development is already anticipated in existing planning documents.

² Pacific Institute, California Flood Rise: Sea Level Rise Newark Quadrangle, 2009.

Development of the project in combination with other cumulative projects would contribute to an increase in the intensity of development in Fremont and Union City. However, the City's General Plan has designated the project area as Urban Reserve in anticipation of future development. Also, the project and the Dumbarton Quarry project together would increase the amount of permanent open space, thereby offsetting the contribution to the increase in development density. No other rezonings are anticipated in the vicinity of the project. Therefore, cumulative impacts to land use and planning would be less than significant.

5.3.12 NOISE AND VIBRATION

The cumulative context evaluated for impacts related to noise and vibration includes any proposed development that could affect the sensitive receptors (residential development) in the immediate vicinity of the project area, which includes the cumulative projects listed in **Section 5.2**. Cumulative noise impacts would be related to either an increase in traffic noise from cumulative project development, or from construction noise occurring concurrently on multiple sites in close proximity.

The traffic model predicts that the peak hour volumes due to regional traffic growth and traffic generated by the project on Ardenwood Boulevard, Paseo Padre Parkway, and Union City Blvd would increase from 33 percent to 197 percent. This volume of traffic would cause the peak hour speeds on the busier thoroughfares to decrease markedly. The net effect is that peak hour traffic noise levels in 2030 would be the same or less than the noise levels today. Therefore, 2030 traffic noise resulting from the project in combination with regional traffic would not present a significant cumulative impact.

The cumulative projects in Union City and the Dumbarton Quarry project are too distant to affect people near the project area during construction and construction noise sources would not combine to exceed local thresholds. The Villa d'Este project could cause temporarily construction noise impacts, if constructed during or subsequent to occupancy at the project. However, it is anticipated that the Villa d'Este project would be completed prior to the construction of the Patterson Ranch Planned District project. In addition, implementation of the mitigation required for the project in **Section 4.12, Noise and Vibration**, would reduce potential impacts from the project to a less-than-significant level. Therefore, temporary noise effects related to construction would not combine and cumulative noise impacts related to construction would be less than significant.

5.3.13 PARKS AND RECREATION

The cumulative setting to parks and recreation includes any proposed development that could affect parks and recreational facilities within Fremont, which includes the projects listed in **Section 5.2**. With the Patterson Ranch Planned District project and the Dumbarton Quarry project, there would be an addition of over 400 acres of preserved open space to the region. The project would also provide private parks within the project and financial contributions to City of Fremont parks. Therefore, the development of the project in combination with the cumulative projects would result in a cumulatively beneficial impact to parks and recreational facilities in the area.

5.3.14 POPULATION AND HOUSING

The cumulative setting for population and housing includes the projects listed in **Section 5.2** within the City of Fremont that could affect the projected population and housing needs of the City. Development of the project in conjunction with other residential projects (Villa d'Este) would add up to 834 new housing units to the City. Based on an average of 3.0 persons per household, these projects would generate approximately 2,502 new residents in Fremont, assuming that all the residents in these units were new to the City. **Table 5-1 Fremont Population Growth and Household Projections** shows ABAG's projections through 2030. The addition of these units and their residents would represent approximately 7.5 percent of the increase in residents projected by ABAG, and would represent 7.1 percent of the anticipated growth of households between 2010 and 2030. Because the cumulative increase in population would not exceed ABAG projections, cumulative impacts to population growth would be less than significant.

Table 5-1 Fremont Population Growth and Household Projections

Year	Population	Households
2005	210,000	70,120
2010	214,200	71,110
2015	221,200	73,650
2025	238,100	79,720
2030	247,400	82,860
2005	210,000	70,120

Source: ABAG Projections 2009

The amount of job-generating land uses proposed by the project and other cumulative projects is relatively small, including two churches. It is not anticipated that these uses would generate sufficient job growth such that they would induce a substantial number of people to move to the area. Additionally, it is not likely that construction workers would relocate their place of residency as a consequence of working on the project and other cumulative projects.

However, the construction jobs would be new jobs and would slightly alter the balance of jobs to employed residents in Fremont. This effect would not be permanent and, therefore, is not expected to change the projected ratio of 0.88 employed residents per job in 2030, shown in **Table 5-2 Fremont Jobs and Employed Resident Projections**. Therefore, indirect cumulative impacts to jobs and housing are considered less than significant.

Table 5-2 Fremont^a Jobs and Employed Resident Projections

	2005	2010	2015	2020	2025
Total Jobs	93,950	94,440	96,410	101,050	112,920
Employed Residents	102,850	104,270	110,620	121,480	130,960
Jobs per Employed Resident	0.91	0.91	0.87	0.83	0.86

^a ABAG employment projections are for Fremont's sphere of influence.

Source: ABAG Projections 2009

5.3.15 PUBLIC UTILITIES AND ENERGY

The cumulative setting for Public Utilities includes any proposed development within Fremont (solid waste, stormwater), the Alameda County Water District (ACWD) service area (water supply), and the Union Sanitation District (USD) service area (wastewater). Development of the project in combination with the cumulative projects within these service areas would result in a cumulative increase in the demand for utilities and urban services, including stormwater and wastewater collection and treatment, and domestic water service, and solid waste collection and processing.

Stormwater

According to the Fremont Municipal Code, Fremont is responsible for ensuring that adequate storm drain facilities are built into new developments. Since much of Fremont's development is relatively recent, the City's current stormwater collection system is in good condition. When localized flooding problems arise, Fremont and

the Alameda County Flood Control and Water Conservation District work together to improve the stormwater collection system to meet 100-year flood standards. Prior to new construction, each project is responsible for the necessary improvements and infrastructure to handle stormwater flows from their project area. Currently, ACFC/WCD has reviewed the project plans and has determined that Crandall Creek (K-line channel) will be adequate to accommodate the 100-year flood and will remain so after planned projects are development, in addition to this project. Cumulative impacts to stormwater facilities would therefore be less than significant.

Solid Waste

Development of the project in combination with other development in the City would increase the cumulative generation of solid waste. The U.S. Environmental Protection Agency (EPA) estimates that the average American contributes 4.6 pounds of solid waste per person per day (U.S. EPA 2006). New developments in Fremont and surrounding cities are required to meet the state and county diversion goals and follow relevant policies of the Waste Reduction and Recycling Act of 1990 (Measure D), which promote waste reduction, recycling, and resource conservation. As discussed in **Section 4.14**, Fremont is currently meeting and exceeding the mandated diversion rate, and landfills that currently service the City and County have sufficient capacity to accommodate the anticipated waste stream until at least 2029. Because the project and other cumulative projects would be required by law to meet the diversion rate, the solid waste generated by these projects would not exceed the local targets for waste reduction or the capacity of landfills and cumulative impacts would be less than significant.

Wastewater

Development of the project in combination with other development in the USD service area would increase wastewater generation. The USD Treatment Plant currently operates at approximately 71 percent of its total capacity. As previously noted, the development of the project area would result in the generation of approximately 0.13 mgd of wastewater daily, or 1 percent of the remaining capacity for the treatment plant. The combination of the project and other cumulative development within the service area of USD would not generate 9.9 mgd of wastewater such that it would exceed the treatment capacity of the plant. Cumulative impacts to wastewater treatment facilities would therefore be less than significant.

Cumulative development would be distributed around the region and each project would be required to perform an evaluation of the capacity of the local wastewater mains and would be required to improve any areas where there was determined to be insufficient capacity. Therefore, cumulative impacts to wastewater mains would be less than significant.

Water Supply

Impact CUM PU-1: Due to uncertainty in the overall water supply to the ACWD service area and potential for reductions in supply, cumulative impacts to water supply could occur. (Significant)

The cumulative development in the ACWD service area would be expected to be comprised of urban infill consistent with demand forecasts of the UWMP. The long-term demand forecasts were based on coordination with Fremont, Newark, and Union City and incorporation of ABAG future population projections from 2003.

Table 5-3, Overview of Contracts and Permits for ACWD's Existing Water Supplies, provides a comparison of the ACWD service area populations from 2003 estimates and more recent 2009 estimates.

Table 5-3 Overview of Contracts and Permits for ACWD's Existing Water Supplies

Cities	2003 Projections			2009 Projections	
	2010	2020	2030	Cities	2030
Fremont	221,600	236,700	257,100	Fremont	247,400
Newark	47,000	50,000	53,500	Newark	52,100
Union City	77,200	86,000	95,300	Union City	95,100
Total	345,800	388,300	405,900	Total	394,600

Source: ABAG 2003, ABAG 2009.

While the project area is within the service area of ACWD it was not incorporated specifically into the 2005 UWMP. As discussed in **Section 4.15, Public Utilities**, the 283-acre feet of additional demand by the project was found to have an impact during drought years. As such, the project in combination with the cumulative projects would result in a significant cumulative impact to potable water supply.

Implementation of the mitigation required for the project in **Section 4.15**, would include the need for up to 300 acre-feet of additional recovery capacity from the Semitropic Water Storage District. By mitigating the project impact for drought water supply, the project has reduced its contribution to cumulative demands to a less than considerable level in regards to overall demand projections. Additional mitigation for project design was also required to address water service needs of the project. Overall the project is within growth projections and cumulative demand estimates of the UWMP.

Table 4.15-4, Patterson Ranch 2008 WSA Projected Normal Year Supply 2007 DWR Reliability Assumptions Water Supply and Demand Comparison: Normal Year in **Section 4.15, Public Utilities and Energy** of this Recirculated Draft Final EIR demonstrates that current projections show an adequate water supply in normal years to meet projected cumulative demand to 2030, with demand of ~~77,183~~ 72,900 acre-feet and supply of ~~77,900~~ 76,000 acre-feet (a surplus estimated as 0.9 percent of total demand). However, there is uncertainty in the long-term availability of the sources of water presented in **Table 4.15-4** due to complex statewide and local water planning issues, especially given the small estimated surplus of supply over demand. The UWMP and WSA qualitatively discuss regulatory and environmental constraints on current and future supplies, and the ACWD supplemented this information in May and December 2009.³ Major issues include potential climate change effects on the future weather patterns and snowfall that would cause changes in the timing and amounts of precipitation for SWP sources, constraints of the Delta to convey SWP supplies, sustained access to banked water supplies in Semitropic water storage, and local efforts to improve Alameda Creek fisheries.

Sources of Uncertainty

Regional Climate Change

The future effects of climate change on long-term water supplies are commonly addressed as effects on precipitation forecasts. Change to weather patterns is difficult to predict and the California Department of Water Resources (DWR) estimates in the 2007 State Water Project Reliability Report a range of 1 percent increase to a 10 percent decrease in precipitation. Both the amount of precipitation and the form that it takes, i.e., snow versus rain, are important. Most SWP supplies are the result of snow pack in the mountains that melts over a long period of time and flows to reservoirs for controlled conveyance to customers. A change from

³ Update on ACWD Water Supply Planning Issues, May 2009.

snow to rain would alter the ability to capture water in reservoirs and would alter the seasonal levels of water flow. This has two primary effects on water planning. One is possibly a reduction in the total amount of water available because of reduced precipitation and the second is a change in how water flow is used to balance ecological concerns and customer demands. This directly affects the water levels of the Delta used to convey water for the SWP.

Sacramento River Delta

The most commonly cited determination on this issue for the Delta is the Federal Court of Appeals “Wanger Decision” from 2007 that contemplated the effects of reduced water supplies from climate change and the effects on endangered species in the Delta. As result of the need to consider SWP flows on the environment, further restrictions on conveyance and pumping from the Delta were mandated that went beyond previous consideration of the overall access to water supply. However, at the time of the writing of this ~~Recirculated Draft~~ Final EIR, there are additional Delta-related supply studies underway. The National Marine Fisheries Service (NMFS) has a pending biological opinion (BO) for Delta salmonoid species issued in June 2009 that could directly affect the flow of SWP water in the Delta and the ability to convey water to ACWD. A potential Habitat Conservation Plan for the Delta is also under consideration. Also of note, the State Legislature is considering plans for protection of the Delta and water conveyance reliability; however there is not an adopted bill or timeline for implementation. An early preliminary estimate of the effects of the NMFS pending biological opinion on SWP supplies from the Delta shows a reduction of approximately 5 to 7 percent in average years.⁴ These figures have yet to be finalized by NMFS or by DWR for the effects on Delta flows. In the event that limitations were to be implemented, there would be a small deficit in average annual supplies and forecast demand in normal years, as shown in **Table 5.4, Annual Average Year Supplies Vs. Demand (Preliminary Delta Salmonid Biological Opinion – 7 Percent Additional Reduction in Water from State Water Project)**.

⁴Eric Cartwright, Water Resources Planning Manager, Alameda County Water District correspondence June 5, 2009; news article San Francisco Chronicle June 4, 2009

Table 5-4 Annual Average Year Supplies vs. Demand (Preliminary Delta Salmonid Biological Opinion - 7 Percent Additional Reduction in Water from State Water Project)

Supply	2010	2015	2020	2025	2030
Imported Supplies					
- State Water Project	24,700	25,000	25,300	25,500	25,761
-San Francisco Regional	15,000	15,000	15,000	15,000	15,000
Total Imported Supplies	39,700	40,000	40,300	40,500	40,700
Local Supplies					
-Groundwater Recharge	21,400	21,400	21,400	21,400	21,400
- Groundwater Storage	0	0	0	0	0
- Del Valle Release	7,100	7,100	7,100	7,100	7,100
- Desalination	5,100	5,100	5,100	5,100	5,100
- Recycled Water	0	0	1,600	1,600	2,600
Total Local Supplies	33,600	33,600	35,200	35,200	36,200
Banking/Transfers					
- Semitropic Banking					
TOTAL SUPPLY	73,300	73,600	75,500	75,700	76,900
TOTAL DEMAND (w/out Project)	73,600	74,700	75,800	76,300	76,900
DEMAND (with project)	73,883	74,983	76,083	76,583	77,183
Difference	(583) [-0.8%]	(1,383) [-1.8%]	(583) [-0.8%]	(883) [-1.2%]	(283) [-0.4%]

Notes:

1. All values, except "Demand (with project) and Difference, are rounded to the nearest 100 AF.
2. Forecast Demands include Project demands.
3. Assumes second phase of recycled water of 1,000 acre feet exists in 2030
4. Demand figures from Patterson Ranch 2008 WSA Table 16

Note to reviewer: There may have been mathematical errors in Table 5-2 of the October 2009 Draft EIR. These errors were corrected in this ~~Recirculated Draft~~ Final EIR.

Source: Alameda County Water District 2008.

Local Climate Change

Localized weather patterns would possibly change the amount or timing of rain which has an effect on surface runoff and groundwater recharge; however it is speculative to estimate any precise effect at this time as no model can predict local weather patterns. Climate change-related sea level rise could also have local effects on the groundwater aquifer and could change the dynamics of salt water intrusion. This would require operational changes by ACWD in the future to protect groundwater supplies.

Alameda Creek Fisheries

ACWD utilizes water from the Alameda Creek Flood Control Channel to recharge the Niles aquifer. Efforts to re-establish steelhead in the creek could cause changes in seasonal flows and timing of recharge.

Semi-tropic Water Banking

While physical capacity exists for storage of water for drought return, the ability to convey return water could be restricted in future drought conditions. The return of water is a complex system of contract water diversions and agreements that often rely on use of the Delta to change water flows. Uncertainties include: 1) water quality concerns with regard to groundwater from Semitropic that is pumped back into the California Aqueduct; and 2) the ability to deliver the water to the ACWD service area. Semitropic has initiated a pilot water treatment plant and may construct a permanent facility. While discussions have been initiated regarding delivery of water, a risk remains that Delta conditions may not permit full annual return of water or could change the seasonal return of water.

Conclusion

Where the effects are quantifiable, these uncertainties have largely been accounted for by ACWD in the Patterson Ranch WSA. In particular, the projections of supply and demand included in **Tables 4.15-4– 4.15-6** show SWP water at only 66 percent of maximum contract values based on DWR projections that account for climate change modeling and reductions in water flows to protect the Delta smelt (the Wanger decision). Other uncertainties identified by ACWD have not been quantified. Changes in District operations may occur as a result of the Alameda Creek Fisheries project and could alter the District's ability to recharge the aquifer, but such an effect, if any, is speculative at this time and cannot be quantified as the amount of water and changes to flows are not known. Additionally, climate change

effects on weather patterns and the associated long term effects on local supplies cannot be calculated, as storage systems could be constructed that are capable of providing continued capacity despite seasonal variations in precipitation timing and amounts. Semitropic water banking is somewhat different in its reliability as it is a replacement source for drought years. Changes to the operations of the SWP project could affect the operations of the Semi-tropic water banking system and possibly limit return deliveries during drought years, but again the quantification of constraints, if any, is unknown at this time. Regardless of precise quantification, there is sufficient uncertainty in water planning for both imported and local supplies that ACWD may need to alter the IRP and UWMP to address alternative water sources for 2030 projected District demand. Due to uncertainty in the overall water supply system and potential for reductions in supply, cumulative impacts to water supply would be significant. The Patterson Ranch Planned District has a cumulatively considerable contribution to this impact on water supply for contributing to possible district wide supply expansion needs.

No additional feasible mitigation measures have been identified.

Significance after Mitigation: Significant and Unavoidable

At this time mitigation measures have not been identified and planned to a level that would secure with certainty an adequate water supply to 2030 for the District. Per **Table 5-2**, it is reasonable to conclude that water supply for the District may be inadequate in 2030. Consequently, the project, along with other cumulative development in the District, may exceed identified water supplies. This constitutes a significant and unavoidable cumulative impact.

Impact CUM-PU 2: Revisions to the UWMP and water supply projects implemented in response to identified uncertainties may result in additional cumulative environmental impacts. (Significant)

Revisions to the UWMP may include adjustments to operational plans, revised demand projections reflecting trend changes, or the provision of new water supplies. No specific measures have been adopted at this time, and a combination of measures would likely be implemented by ACWD. ACWD has identified the following alternatives that may reasonably be implemented to ensure an adequate water supply in 2030:

- Secure water supply from expanded Los Vaqueros Reservoir
- Secure water supply from future regional desalination plants

- Secure additional water supply with Semitropic Water Storage District, and possibly utilize local storage available to ACWD (Niles Cone Groundwater Basin, Del Valle Reservoir, San Luis Reservoir)
- Implement water management and conservation strategy
- Augment planned recycled water system capacity and delivery

Of the alternatives considered, modifications in ACWD operations resulting in greater conservation or adjustments to demand trend projections would not have the potential for an adverse impact on the environment. The Semitropic banking program has received all required environmental reviews, although construction of a water treatment plant may require additional environmental reviews.

However, securing additional water through the construction of new facilities could have potential effects on the environment, as such facilities do not currently exist and additional transmission infrastructure could be required.

ACWD, at this time, is not planning to construct any major facilities to increase water supply. Rather, ACWD may purchase water from other agencies that are considering the construction of major facilities. Hence the project's impact on the planned construction of new water supply facilities is remote and speculative. However, this section of the ~~Recirculated Draft~~ Final EIR summarizes the known potential environmental effects of proposed facilities that may provide additional water to ACWD.

ACWD may obtain additional water from large scale brackish water desalination plants. ACWD has identified two such projects are in the planning stages in Contra Costa County, and ACWD potentially could participate with other agencies in obtaining water from these plants.⁵ Due to the indirect provision of water to ACWD through "wheel agreements" the physical impacts of water supplied through desalination would be generally limited to the construction and operation of the plants. Distribution of water to ACWD would be consistent with current practices and would utilize existing transmission infrastructure. Potential adverse impacts of desalination may include the likely combined estimated site disturbance of between 2 and 10 acres of land for the siting and construction of each facility, impacts to biological resources both on site and within waterways for intake infrastructure, potential changes to water bodies from effluent, energy consumption of operations, and waste disposal of brine from operations.

⁵ Eric Cartwright, Water Resources Planning Manager, Alameda County Water District (ACWD); written communication to Kelly Diekmann, Senior Planner, City of Fremont; May 29, 2009.

However, effective mitigation measures are available for these potential impacts.⁶ As no site is currently permitted, there are potential impacts from construction and operation of a facility. However, each facility would be subject to independent permitting and environmental review, making it likely that mitigation measures for potential impacts can be identified and implemented for the development of desalination plants. Specific impacts due to the proposed desalination plants are speculative and cannot be determined until such time as the projects undergo environmental review.

The second major water resource project identified by ACWD is the Los Vaqueros Reservoir expansion proposed by Contra Costa Water District at the eastern edge of Contra Costa and Alameda Counties. This facility is most likely to be built in the near term. The existing 100,000 acre feet reservoir is proposed for expansion to up to 275,000 acre feet, with an alternative that includes a new transmission connection to the South Bay Aqueduct (now used for SWP deliveries to ACWD). Of the potential 175,000 acre feet expansion, up to 32,000 acre feet may be available for South Bay Aqueduct deliveries to water contractors including ACWD. The Contra Costa Water District has completed a Draft EIR (SCH 2006012037) and released it for public comment in February 2009. The Draft EIR identified a range of impacts from the project mitigation measures. Significant and unavoidable impacts of the project alternative with connections to the South Bay Aqueduct include: 1) Loss of San Joaquin kit fox habitat along the reservoir edge; and 2) loss of important farmland (as designated by the State). The loss of important farmland is a direct result of providing transmission infrastructure from the reservoir to the South Bay Aqueduct. All other potential impacts of project could be mitigated to a less than significant impact as identified in the ~~Recirculated Draft-Final~~ EIR. While the Los Vaqueros project is not dependent on ACWD participation, participation by ACWD in the project would contribute to the cumulative demand for the project and its implementation and the resulting unavoidable significant effects. However, the Contra Costa Water District has not yet determined whether it will proceed with the Los Vaqueros Reservoir project or other projects.

ACWD also could be associated with a number of other regional projects that are in the planning stages that may have potential environmental effects because of District's SWP contracts. Many small and large projects have been proposed to improve the reliability of water that is provided through the Delta, but the timing

⁶ See, for instance, Final EIR, Marin Municipal Water District Desalinization Project, December 2008.

and scale of such projects is speculative. ACWD would not be a direct provider of water supplies, nor would it construct these regional facilities, but it may purchase additional water from the SWP and so indirectly contribute to the environmental effects of these facilities. However, these impacts are speculative and not foreseeable, given the lack of an adopted plan and the District's limited involvement.

No additional feasible mitigation measures have been identified.

Significance after Mitigation: Significant and Unavoidable

Any future water supply projects are likely to have potentially significant adverse effects on the environment regardless of the specific type of project that is eventually implemented. However, these cannot be determined until projects are selected and environmental review is completed. Given the lack of any adopted plan for future water supply facilities and ACWD's limited involvement in the construction of these facilities, the potential environmental impacts of the construction of future water supply facilities are too speculative for further evaluation.

5.3.16 SCHOOLS AND LIBRARIES

The cumulative setting to schools facilities and services includes any proposed development within the Fremont Unified School District (FUSD). The project in combination with other residential projects in the Fremont, listed in **Section 5.2**, would generate new students and would be required to pay development impact fees to the FUSD, consistent with the requirements of Senate Bill (SB 50).

Payment of these fees is considered to completely mitigate any impacts to schools. Therefore cumulative impacts to school facilities or services would be less than significant.

The cumulative context evaluated for impacts to libraries includes any proposed residential development within City. The project and the other residential projects, listed in **Section 5.2**, would result in an increased demand for library services. However, based on the City's adopted general plan, this population increase will not, in and of itself, require a new or expanded library and is not considered to be significant. Cumulative impacts would therefore be less than significant.

5.3.17 TRANSPORTATION AND CIRCULATION

The cumulative setting to transportation and circulation includes areas that are greatly affected by the growth of regional traffic volumes. The cumulative analysis is built on the 2015 and 2030 Fremont travel demand model maintained by the Alameda County Congestion Management Agency, which includes an annual growth factor to account for regional increases in vehicle traffic and congestion.

A traffic model was built to forecast traffic volumes in 2030 to determine the project's contribution to traffic impacts in the more distant future. This model was built using growth projections for 2030, as derived from the 2030 ACCMA and Fremont travel demand model. The conditions in 2030 (2030 baseline) incorporate the cumulative projects listed in **Section 5.2**, and add substantial regional traffic growth. Intersection LOS for 2030 conditions, both with and without the project, are summarized in **Tables 5-5, 2030 LOS Comparison for Signalized Intersections (AM Peak)** and **5-6, 2030 LOS Comparison for Signalized Intersections (PM Peak)**, which provide a LOS comparison for the AM and PM peak periods, respectively.

Impact CUM TC-1: The addition of project-related traffic to the 2030 Baseline would add significant delays to some intersections already operating at LOS F or worse in 2030. (Significant)

As shown in **Table 5-5**, the project in combination with the 2030 baseline would have cumulative impacts at ten signalized intersections during the AM peak period. During the PM peak period, the project in combination with the 2030 baseline would have cumulative impacts at eight signalized intersections (**Table 5-6**).

The cumulative impact of the project is considered to be significant if the addition of project-related traffic to the 2030 baseline would cause intersections operating at LOS F in 2030 to have an increase in average intersection delay of 4.0 or more seconds in Fremont and Newark and 1.0 second in Union City.

As shown in **Table 5-5**, implementation of the project would contribute to an additional significant increase in delay at three intersections during the AM peak period and would contribute to an additional significant increase in delay at ~~two~~ three intersections during PM peak period.

Table 5-5 2030 LOS Comparison for Signalized Intersections (AM Peak)

	Intersection	2030 Baseline		2030 Baseline with Project		2030 Baseline w/ Project - 2030 Baseline	Potentially Significant Impact
		Delay	LOS	Delay	LOS	Delay	
1	Thornton Avenue/SR-84 EB ^d	42.8	D	47.6	D	4.80	LTS
2	Paseo Padre Parkway/SR-84 WB ^d	258	F	261.5	F	3.5	LTS
3	Ardenwood Boulevard/Paseo Padre Parkway	24.4	C	25.0	C	0.60	LTS
4	Union City Boulevard/Lowry Avenue ^b	167.9	F	169.3	F	1.40	Impact
5	Union City Boulevard/Dyer St ^b	10.3	C	10.4	B	0.10	LTS
6	Alvarado Boulevard/Dyer St ^b	166.7	F	107.7	F	4.00	Impact
7	Ardenwood Boulevard/SR-84 WB ^d	28.6	C	31.5	C	2.90	LTS
8	Ardenwood Boulevard/SR-84 EB ^d	19.5	B	21.6	C	2.10	LTS
9	Newark Boulevard/Jarvis Avenue ^c	51.1	D	51.0	D	-0.10	No Impact
10	I-880 NB Ramp/Decoto Road ^d	363.4	F	364.3	F	0.90	LTS
11	I-880 SB Ramp/Decoto Road ^d	257.3	F	258.9	F	1.60	LTS
12	Fremont Boulevard/Decoto Road	196.6	F	196.3	F	-0.30	No Impact
16	Deep Creek Road/Paseo Padre Parkway	179.6	F	180.2	F	0.60	LTS
17	Ardenwood Boulevard/Kaiser Drive	18.3	B	19.5	B	1.20	LTS
18	Ardenwood Boulevard/Commerce Drive	139.3	F	150.3	F	11.0	Impact
20	Fremont Boulevard/Paseo Padre Parkway	104.7	F	107.2	F	2.50	LTS
21	Ardenwood Boulevard/Ranch Drive ^a	8.6	A	23.0	B	14.40	LTS
22	Tupelo St/Paseo Padre Parkway	94.4	F	27.6	C	-66.80	No Impact

Intersections operating below acceptable LOS D are in show in bold text.

NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound

LTS = less than significant impact

Average delay in shown in seconds per vehicle.

a This intersection is currently unsignalized, but would be signalized as part of the project.

b Union City intersection.

c Newark intersection

d Caltrans intersection

Source: DKS Associates, 2010

Table 5-6 2030 LOS Comparison for Signalized Intersections (PM Peak)

	Intersection	2030 Baseline		2030 Baseline with Project		2030 Baseline w/ Project - 2030 Baseline	Potentially Significant Impact
		Delay	LOS	Delay	LOS	Delay	
1	Thornton Avenue/SR-84 EB ^d	134.6	F	149.4	F	14.80	Impact LTS
2	Paseo Padre Parkway/SR-84 WB ^d	20.4	C	22.9	C	2.50	LTS
3	Ardenwood Boulevard/Paseo Padre Parkway	27.4	C	28.3	C	0.90	LTS
4	Union City Boulevard/Lowry Avenue ^b	19.1	B	19.6	B	0.50	LTS
5	Union City Boulevard/Dyer St ^b	14.5	B	16.6	B	2.10	LTS
6	Alvarado Boulevard/Dyer St ^b	172.8	F	177.4	F	4.60	Impact
7	Ardenwood Boulevard/SR-84 WB ^d	18.8	B	19.0	B	0.20	LTS
8	Ardenwood Boulevard/SR-84 EB ^d	70.5	E	73.1	E	2.60	LTS
9	Newark Boulevard/Jarvis Avenue ^c	152.3	F	157.1	F	4.80	Impact
10	I-880 NB Ramp/Decoto Road ^d	254.6	F	257.4	F	2.80	LTS
11	I-880 SB Ramp/Decoto Road ^d	42.2	D	46.4	D	4.20	LTS
12	Fremont Boulevard/Decoto Road	91.1	F	92.8	F	1.70	LTS
16	Deep Creek Road/Paseo Padre Parkway	71.9	E	73.1	E	1.20	LTS
17	Ardenwood Boulevard/Kaiser Drive	18.7	B	19.7	B	1.00	LTS
18	Ardenwood Boulevard/Commerce Drive	40.6	D	47.9	D	7.30	LTS
20	Fremont Boulevard/Paseo Padre Parkway	124.8	F	124.6	F	-0.20	No Impact
21	Ardenwood Boulevard/Ranch Drive ^a	8.2	A	25.9	C	17.70	LTS
22	Tupelo St/Paseo Padre Parkway	72.4	E	22.2	C	-50.20	No Impact

Intersections operating below acceptable LOS D are in show in bold text.

NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound

LTS = less than significant impact

Average delay in shown in seconds per vehicle.

a This intersection is currently unsignalized, but would be signalized as part of the project.

b Union City intersection.

c Newark intersection

d Caltrans intersection

Source: DKS Associates, 2010

The increases in delay would be considered a considerable contribution to the cumulative impact at the following intersections:

- Alvarado Boulevard/Dyer Street during AM and PM peak periods;
- Newark Boulevard/Jarvis Avenue during PM peak period;
- Ardenwood Boulevard/Commerce Drive during AM peak period; ~~and~~
- Union City Boulevard/Lowry Avenue during AM peak period; and
- Thornton Avenue/SR-84 EB.

With the implementation of **Mitigation Measure TC-3a**, the project's contribution to the average delay at the intersection of Alvarado Boulevard/Dyer Street would be less than 1 second during the AM and PM peak hours under the year 2030 plus project conditions.

Mitigation Measure CUM TC-1a: Increase intersection cycle length at the Newark Boulevard/Jarvis Avenue intersection.

In order to mitigate potential cumulative impacts during the PM peak period at the intersection of Newark Boulevard/Jarvis Avenue, the intersection cycle length shall be increased from 100 seconds to 110 seconds.

The project proponent(s) shall pay the cost to increase the cycle length at the Newark Boulevard/Jarvis Avenue intersection if the City of Newark permits and commits to the mitigation. With this mitigation in place, the intersection average delay would be less than 4.0 seconds during the PM peak hour and the cumulative impact would be reduced to a less-than-significant level. If the City of Newark does not permit and commit to the mitigation, the impact at the Newark Boulevard/Jarvis Avenue intersection would be significant and unavoidable.

Mitigation Measure CUM TC-1b: Modify the intersection of Ardenwood Boulevard/Commerce Drive.

In order to reduce project impacts during the AM peak period at the intersection of Ardenwood Boulevard/Commerce Drive, the project proponent(s) shall pay to fund the modification of this intersection. The intersection of Ardenwood Boulevard/Commerce Drive shall be designed with the following components:

- Restriping the one shared left-through-right turn lane on the westbound approach to include one left-turn and one through shared right-turn lane.

- Modify the traffic signal to match the revised striping. This may include replacing mast arms, signal heads and vehicle detectors.

With this mitigation in place, the intersection level of service would remain at LOS F during the AM peak period, but would reduce delays to less than 4.0 seconds, which would not exceed the threshold of significance. Therefore, the cumulative impact would be reduced to a less-than-significant level.

Mitigation Measure CUM TC-1c: Increase intersection cycle length at the Union City Boulevard/Lowry Avenue intersection.

In order to achieve a difference in average delay of less than 1.0 seconds or better during the AM peak hour, the intersection cycle length shall be increased from 100 seconds to 110 seconds.

The project proponent(s) shall pay the cost to increase the cycle length at the Union City Boulevard/Lowry Avenue intersection if Union City permits and commits to the mitigation. With this mitigation in place, the intersection average delay would be less than 1.0 seconds during the AM peak period, reducing the cumulative impact to a less-than-significant level. If Union City does not permit and commit to the mitigation, the impact at the Union City Boulevard/Lowry Avenue intersection would be significant and unavoidable.

Mitigation Measure CUM TC-1d: Increase intersection cycle length at the intersection of Thornton Avenue/SR 84 EB ramp.

In order to improve the overall LOS and reduce additional delay to less than 4 seconds, preference of additional time for left turn movements from the ramp to Thornton Avenue is required. The signal timing will need to be adjusted from its current 50 second cycle to a cycle of 58 seconds so that the increase in average delay is less than 4 seconds. As a State facility, the management of traffic operations are monitored on a regular basis and subject to adjustment by Caltrans. If Caltrans does not choose to implement a change to the signal timing when traffic volumes warrant an adjustment, the impact at the Thornton Avenue/SR 84 EB intersection would be significant and unavoidable.

Significance after Mitigation: Significant and Unavoidable

Compliance with these measures would ensure that improvements were made to the intersections anticipated to be significantly affected by cumulative project traffic. Implementation of the proposed improvements would improve future traffic conditions at these locations, as shown in **Table 5-7 Cumulative with Project Mitigated Condition – LOS Summary**.

Table 5-7 Cumulative with Project Mitigated Condition - LOS Summary

	Intersection	Peak	Project		Cumulative Baseline		Cumulative w/ Project		Mitigated Conditions		Significant Impact After Mitigation
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	
1	Thornton Ave/SR-84 EB	PM	14.8	B	134.6	F	149.4	F	135.5	F	NO
6	Alvarado Blvd/Dyer St	AM	41.5	D	166.7	F	170.7	F	164.9	F	NO
		PM	66.0	E	172.8	F	177.4	F	171.4	F	NO
9	Newark Blvd/Jarvis Ave	PM	44.6	D	152.3	F	157.1	F	154.6	F	NO
18	Ardenwood Blvd/Commerce Dr	AM	12.9	B	139.8	F	150.3	F	87.3	F	NO
4	Union City Blvd/Lowry Ave	AM	31.1	C	167.9	F	169.3	F	164.1	F	NO

Source: DKS Associates, 2010.

Implementation of **Mitigation Measures CUM TC-1a** and **CUM TC-1c** would reduce the project impacts such that they would not represent a cumulatively considerable contribution to the intersection of Newark Boulevard/Jarvis Avenue. However, if Caltrans, and the Cities of Newark and Union City do not permit and commit to the mitigation for the Thornton Avenue/SR-84 EB, Newark Boulevard/Jarvis Avenue and Union City Boulevard/Lowry Avenue intersections, the impacts at these respective intersections would be significant and unavoidable. Because it is uncertain whether these jurisdictions would commit to the above-mentioned mitigation measures, and although this EIR has identified feasible mitigation measures, this EIR conservatively assumes that this impact would be significant and unavoidable.

Impact CUM TC-2: Cumulative-related traffic would exceed the vehicle capacity of each lane on Ardenwood Boulevard. (Significant)

Ardenwood Boulevard is two lanes in each direction, which is not sufficient to accommodate the anticipated peak period traffic flows under 2030 conditions with or without the project. This is considered a significant cumulative impact.

Each lane on Ardenwood Boulevard has a design capacity of 800 vehicles per lane per hour. It is anticipated that development of the project would result in over 1,600 vehicles using the road in the southbound direction during AM peak period and in the northbound direction during the PM peak period, thereby exceeding the capacity of the two lanes.

Under the 2030 Baseline Cumulative No-Project Condition, southbound traffic in the AM and northbound traffic in the PM on Ardenwood Boulevard is projected to exceed 2,400 peak period vehicles, before the addition of project traffic, as shown in **Table 5-8**. The project would contribute between 1 percent and 3 percent of the cumulative traffic along the roadway segment of Ardenwood as shown in **Table 5-8**.

Table 5-8 Cumulative Traffic along Ardenwood Boulevard between Paseo Padre Parkway and Lowry Road (2 Lanes)

Intersection	Peak	Capacity	2030 Baseline		Project trips	Cumulative w/ Project		Project Contribution (%)
			Link Volume	LOS		Link Volume	LOS	
Ardenwood Boulevard NB	AM	1,600	469	A	99	568	A	21%
Ardenwood Boulevard SB	AM	1,600	2,641	F	34	2,675	F	1%
Ardenwood Boulevard NB	PM	1,600	2,594	F	65	2,659	F	3%
Ardenwood Boulevard SB	PM	1,600	863	A	112	975	A	13%

Source: DKS Associates, 2010.

Mitigation Measure CUM TC-2: Widen Ardenwood Boulevard.

In order to accommodate the anticipated peak period traffic demand under cumulative conditions, the project proponents shall complete its fair share of the project by widening Ardenwood Boulevard along the project frontage to three lanes in each direction and installing bike lanes from Paseo Padre Parkway to Ranch Drive. The project shall also dedicate right-of-way along the project frontage for the entire length of Ardenwood Boulevard to allow for future widening, if needed, and shall complete the improvement for the new Ardenwood Boulevard and Ranch Drive intersection. The widening of Ardenwood Boulevard shall conform to City Standard Specifications for median islands, sidewalks, and bicycle lanes. With this improvement, Ardenwood Boulevard would adequately accommodate the anticipated cumulative AM and PM peak period traffic demand, thereby reducing roadway capacity impacts to less than significant.

Significance after Mitigation: Less than Significant